and thereafter descends to the low-lying grounds of the valleys, displacing the warmer air below. During the unusually dry clear months of January and July 1881 the mean temperature of Park Hill exceeded that of Beddington by 3°·5 and 2°·5 respectively. Hence the first three of the five stations which are on sloping ground have, though at greater elevations than the other two stations below, higher mean temperatures.

This peculiarity in the distribution of the night and the winter temperature becomes the more intensified as the valley is deeper and its sides steeper, and as calms and light winds prevail. Thus at Klagenfurt, situated in one of the valleys of the Tyrol, the mean temperature of January is 20°·7, whereas at the station of Obergipfel, about seven miles distant and 4270 feet higher, the mean for the same month is 19° 9, being thus less than a degree lower than that of Klagenfurt. The subject is one that has seldom received the earnest attention it deserves, particularly in drawing the isothermals of the globe. The Croydon Club would make a clear addition to their observing-system if new stations were established on knolls in the valley of the Wandle for the further prosecution of this inquiry.

The means of temperature from Greenwich and Kew would have had real value in this inquiry if Mr. Eaton could have availed himself of observations made at these Observatories with thermometers exposed in the Stevenson screen. But, as pointed out, the different modes of exposing the thermometers render the results of the three systems of observing incomparable *inter se*. Thus the mean of the daily highest temperature of August for the five years is 72°·5 for Greenwich, and 69°·5 for Kew.

The rainfall has been far more extensively observed in the district, the returns of no fewer than seventy stations being available. Grouping the stations according to height, the annual amounts at stations below 200 feet show a mean of 23·27 inches; 200 to 400 feet, 25·39 inches; 400 to 600 feet, 29·12 inches; 600 to 800 feet, 31·66 inches; and above 800 feet, 31·36 inches. The largest amounts of rain occur not on the ridge of the North Downs, but some distance on the lee-side in regard to the prevalent rainy south-westerly winds; and the amount at like elevations seems also to diminish from west to east. As regards the monthly rainfall, the depth is greater in the upper groups; but the ratios of the monthly to the annual fall show that in spring, but more particularly in summer, there falls proportionally a larger amount of rain in the lower group of stations, whose average elevation is 193 feet. The relatively large increase in the summer rainfall over low-lying plains is one of the most striking facts in the geographical distribution of the rainfall, and is probably due to the physical causes concerned in the development of thunderstorms.

NOTES ON THE RECENT SWARMING OF APHIDES

THE immediate cause of the sudden appearance of clouds of insects in certain localities is not very apparent, but it may be surmised that the predominance or scarceness of their natural insect foes has much control over the phenomenon; added to which must be taken into account the effects of weather and temperature. A few days ago I had a notice from an obliging Birmingham correspondent, Mr. George Baker, who kindly furnished me with the following particulars:—

On October 5 the town of Mansfield, on the borders of Sherwood Forest, was visited by a cloud of Aphides, which swarmed in the town and over the country round, across an area of many miles. The town was visited "literally by millions; every one, as they walked along, waving their handkerchiefs or newspapers before their faces to avoid inhaling the insects. . . . Wet paint was covered by a mass of these black Aphides." This swarm continued with decreasing numbers throughout five days, and heavy rain during part of this time did not seem much to affect them. On the road to Nottingham these insects were noticed as engaged in singular gyrations and undulatory dances above the tops of the spruce-firs, there forming dense pyramidal columns.

A similar cloud, but less remarkable as to numbers, was observed about the same time at Birmingham; which, however, as the town must be at least 50 miles distant, can be scarcely considered as forming a part of this same swarm. Possibly similar causes operated to produce the like phenomenon in both places.

These insects proved on examination to be *Rhopalosiphum dianthi* of Schrank, which is identical with *Aphis persicæ* of Morren, and *A. rapæ* of Curtis, and *A. vastator* of Smee. It is a veritable pest in some years, doing considerable damage to turnip, mangel, and other crops, and in our gardens injuring our peach-trees. This present notice of its swarming is, however, by no means unprecedented.

In September and October 1834 Morren noted an immense swarm all over Belgium, and states his belief that it came across the sea from England. He says they obscured the light of day, and covered the walls of the houses so as partially to conceal them. Gilbert White notes that in August 1785 the people of Selborne were surprised by a swarm of "smother flies." Those that were walking in the street found themselves covered with these insects, which blackened the hedges and vegetables round. White thought these might be emigrations from the hop-gardens of Kent and Sussex, and from those near Farnham. If so, the species differs from the insects above noticed.

The choice of high objects to dance over is not confined to Aphides, *e.g.* many of the Tipulidæ. The singular persistent dance of *Anthomyia meteorica* over the heads of horses is familiar to all.

G. B. BUCKTON

NOTES

A MOST attractive group of birds has just been placed by Prof. Flower in the great hall of the Natural History Museum at South Kensington. The case is intended to illustrate the hybridisation of species in a state of nature, and the species selected are the hooded and carrion crows (*Corvus cornix* and *C. corone*) and the European and Asiatic goldfinches (*Carduelis elegans* and *C. orientalis*). The series of these birds has been presented to the Museum by Mr. Henry Seebohm, who procured the specimens himself during his travels in Siberia. The case of the crows is one of the few instances known of actual wild hybridisation, though many more are suspected, especially among the game birds. It is certain, however, that wherever the colonies of hooded crows meet the carrion crow throughout the Palæarctic region the two species interbreed freely, and the result is shown in the young, the gray saddle-back of the hooded crow exhibiting a considerable admixture of black owing to the strain of *C. corone* in the parentage. The case of the goldfinches is not quite so completely proved, but is apparently a parallel instance of hybridisation. The British Museum has been for some time indebted to Mr. Seebohm for very valuable presents of birds, which have been mounted in the bird-galleries. Not long ago he gave a specimen of Ross's gull (*Rhodostethia rossi*), one of the rarest of the *Laridæ*, and a species which was a *desideratum* to the national collection. He presented also, last year, a fine case of Steller's sea-eagle (*Haliaëtus pelagicus*) from Kamchatka.

THE Geodetic Conference began its meetings in Berlin last week. The countries represented are Belgium, by two delegates; Denmark, by one; Germany, by fourteen, including Prof. Dr. Förster, of the Royal Observatory, Prof. Helmholtz, Dr. W. Siemens, and Colonel Golz, of the Trigonometrical Survey: France, by two, namely, MM. Faye and Tisserand; Italy, by one; the Netherlands, by one; Norway, by one; Austria, by three; Portugal, by one; Roumania, by two; Russia, by two, including Dr. von Struve, of the Observatory at Pulkowa; Sweden, Switzerland, and Spain, each by one. England, strange to say, is not represented; nor has any one come from the United States. Prof. Dr. Förster, of Berlin, was elected President, and Dr. von Struve, of Pulkowa, Vice-President of the Conference. In his opening address, Herr von Gossler, Prussian Minister of Public Worship, indulged in some general observations as to the progress and aims of geodetic science, and, in the name of the Prussian Government, thanked the various foreign deputies for their appearance in Berlin. The chief task of the present Conference has been to settle the organisation of the central geodetic bureau, which is to have its permanent seat in Berlin, in connection with the Geodetic Institute of Prussia, founded by the late Lieut.-General von Bäyer. It was at the instance of Lieut.-General Bäyer that the first constituent international meeting of geodetic experts was held in Berlin in 1864, and it is by the establishment of a central international bureau here, supported by quotas from the various countries which it represents, that it is intended to preserve to Prussia the leading part she has always taken in promoting the science of earth-measuring and all its kindred branches. The permanent Committee elected includes Prof. Hirsch, of the Neuchâtel Observatory (Secretary), Professors Förster (Prussia), Sande (Holland), Faye (France), Ferrero (Italy), Ibànnez (Spain), Ragel (Saxony), Oppolzer (Austria), Stepnicki (Russia), and Zachariae (Denmark). The next Conference will be held in 1887 at Nice, on the invitation of M. Bischoffsheim, owner of the great Observatory there. Before separating, the Conference passed a resolution requesting the Prussian Government to invite other States to join the International Geodetic Society.

At a recent meeting of the Common Council it was decided that it be referred to the Gresham Committee to consider whether the moneys now paid for lectures under the provisions of Sir Thomas Gresham's will might be devoted to the encouragement of students destined for commercial careers acquiring a useful knowledge of modern languages, with instructions to confer with the Mercers' Company, and to report thereon forthwith.

The Professor of Physics of the University of Vienna, Dr. Victor Pierie, died suddenly of appoplexy in his laboratory on Friday last.

At the Potato Centenary on December 2 and 3, to which we have already referred, the following subjects for conferences have been proposed:—First day, Morning: (1) historic consideration of the question, Whence came the potato to England? (2) the Incas and their cultivation of the potato; (3) distinct wild species of the potato as at present recognised; (4) the production of varieties by cultivation. Afternoon: (5) the potato disease; (*a*) historic sketch, (*b*) our present knowledge of the disease. Second day, Morning: (1) proposed methods for preventing the disease; (2) methods for using partly diseased potatoes; (3) methods for storing and preserving potatoes. Afternoon: conference of cultivators on rates for transport of potatoes.

The French Government has granted the funds required for the completion of the Algiers Observatory, which will be in full operation next spring. Two assistant astronomers have already been sent to join M. Trépied, and two others will be selected from among the pupils of the School of Astronomy this winter. A special Congress will be held in Paris, in the month of April, for determining the part that the Algiers Observatory will take in stellar photography. The direct image of the sun will be 6 centimetres in diameter. A spectroscope by Thollon will be put into operation. The extent of the spectrum will be 10 metres. M. Trépied has organised the electrical transmission of the time to the Hôtel de Ville of Algiers and Tunis. Colonel Perrier, head of the French and Algerian Survey, is arranging the measurement of the requisite triangles for connecting the Algiers Observatory with the Colonne Voirol, the starting-point of the Algerio-Tunisian system of triangulation.

Mr. W. A. Carter, of the Colonial and Indian Exhibition, writes to us that during this last spring he placed a specimen of the Mexican axolotl in an empty (? dry) receptacle, where it has remained ever since. It is in a lively condition. The colour of the animal has become less intense, the gills have apparently disappeared, and the powers of locomotion seem quickened.

It is worthy of note that at the establishment of the National Fish Culture Association many of the brook trout (*Salmo fontinalis*) hatched during February 1885 commenced to spawn last week, yielding about five hundred ova each. This fact is another proof of the extraordinary reproductive capacity of fishes in spite of age and artificial existence, for the fish in question have been maintained in a pond of limited dimensions. The size of the ova is small as compared with those of mature fish, therefore it is not likely that the trout when hatched will be large. The parents are in a healthy condition, and seem in no way weakened.

A consignment of nearly a thousand German carp of various kinds has arrived at the Colonial and Indian Exhibition. The great hardihood of the carp is evidenced by the fact that the fish in question were retained in carriers for sixty hours before being placed in tanks, when only two were found to have succumbed.

In a paper in the October number of the *American Journal of Science* by Mr. O. W. Huntington, "On the Crystalline Structure of Iron Meteorites," the author concludes as follows:—"We have tried in this paper to establish the following points: (1) that many of the masses of meteoric iron in our collections are cleavage crystals, broken off probably by the impact of the mass against the atmosphere; (2) that these masses show cleavages parallel to the planes of all the three fundamental forms of the isometric or regular system, namely, the octahedron, the cube, and the dodecahedron; (3) that the Widmanstättian figures and Neumann lines are sections of planes of crystalline growth parallel to the same three fundamental forms of the isometric system; (4) that on different sections of meteorites Widmanstättian figures and Neumann lines can be exhibited in every gradation, from the broadest bands to the finest markings, with no break where a natural line of division can be drawn; (5) that the features of the Widmanstättian figures are due to the eliminations of incompatible material during the process of crystallisation. This investigation throws no new light upon the origin of meteorites, except so far as it strengthens the opinion that the process of crystallisation must have been extremely slow. The occurrence of large masses of native iron occluding hydrogen gas, and containing nickel, cobalt, phosphorus, sulphur, &c., implies a combination of conditions which the spectroscope indicates as actually realised in our own sun and in other suns among the fixed stars, and the most probable theory seems to be that these masses were thrown off from such a sun, and that they very slowly cooled, while revolving in a zone of intense heat. In this paper we have not taken into consideration a number of iron masses, whose meteoric origin has been generally accepted, which show no Widmanstättian figures, and not even any Neumann lines. A considerable proportion of these are certainly not meteoric. In the Harvard cabinet there are two specimens, labelled respectively Campbell County (Tennessee), and Hominy

Creek (North Carolina), which are evidently nothing but cast-iron, and a third, labelled Tarapaca Hemalga (Chili), which is probably of similar material. We could find on the specimens of this class in the Harvard collection no distinct evidences of crystallisation; but also we could find no features incompatible with that unity of structure which it has been the chief object of this paper to illustrate."

Mr. Horatio Hale has issued in pamphlet form his address "On the Origin of Languages and the Antiquity of Speaking Man," delivered before the Anthropological Section of the American Association for the Advancement of Science at Buffalo last August. The author's views were much discussed at the time, and those interested in the subject will be thankful to have them presented in this convenient form. Rejecting all the theories hitherto advanced by Lyell, Frederick Müller, and others, he endeavours to account for the vast number of *specifically distinct* languages spoken by races *not specifically distinct* by assuming that they originated from children's prattle in independent centres after the spread of speechless man over the globe. The cases are mentioned of the Boston twins born in 1860 and of some other "Geschwister," who appear to have evolved and practised for some time infantile jargons understood only amongst themselves, which it is argued might, under favourable conditions of isolation and so forth, develop into regular forms of speech consistently worked out with their own vocabularies and grammatical structure. In this way linguistic families differing absolutely one from the other need not be of any great antiquity, and in fact may have been developed from slight germs in many places and at different times since the dispersion of the "*homo alallus*" from some given centre. This *homo alallus* himself is admitted to be the lineal descendant of the men of the Stone Age, who are assumed to have been speechless, so that all forms of speech now current may be of comparatively recent date, say, not more than 8000 or 10,000 years, notwithstanding their great number and profound differences. This theory, which refers human speech in the first instance to "the language-making instinct of very young children," is presented with considerable force and plausibility, but will scarcely be taken seriously either by philologists or anthropologists. The latter especially will find it difficult to accept the conclusion that man properly so called, the *homo sapiens*, as distinguished from his precursor of the Neolithic Age, does not date further back than "somewhere between 6000 and 10,000 years ago." The theory also requires us to regard this first speaking man as already fully developed, possessing "intellectual faculties of the highest order, such as none of his descendants has surpassed," thus reversing the conclusions of modern anthropology.

It is reported from Vienna that a great ice cavern has been discovered on the southern slope of the Dachstein, or Schneeberg, the very conspicuous lofty mountain in Lower Austria, which is visible from the ramparts of the capital. The general direction of the cavern runs from south to north, and it has been explored for a distance of 600 metres, a sharp precipice seemingly 14 metres deep having stopped for the time further progress. The cavern is from 5 to 6 metres broad, and very lofty, giving the impression that the ice is enormously thick. The explorers are of opinion that a subterranean lake will be found in the cavern.

The additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus* ♀) from India, presented by Miss Edith Prowse; four Common Hedgehogs (*Erinaceus europæus*), British, presented by Mr. W. Walkinshaw; a —— Buzzard (*Buteo* ——) from Mogador, North Africa, presented by Mr. P. L. Forwood; a Ring-necked Parrakeet (*Palæornis torquatus* ♀) from India, presented by Mr. W. S. Bradshaw; an Aldrovandi's Skink (*Plestiodon auratus*) from North Africa, deposited; a Rusty-spotted Cat (*Felis rubiginosa*) from Ceylon, two Diuca Finches (*Diuca grisea*) from Chili, two Wood Larks (*Alauda arborea*), British, purchased; eight Long-fronted Gerbilles (*Gerbillus longifrons*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

The Binary Star γ Coronæ Australis.—Mr. H. C. Wilson, of Cincinnati Observatory, has published elements of the orbit of this interesting southern double star in the *Sidereal Messenger* for October. These elements, which do not differ much from a set recently computed by Mr. Gore (*Monthly Notices*, vol. xlvi. p. 104), are as follows:—

$P = 78{\cdot}80$ years
$T = 1887{\cdot}40$
$e = 0{\cdot}324$
$\gamma = 50^{\circ}{\cdot}5$
$\lambda = 139^{\circ}{\cdot}0$
$\Omega = 41^{\circ}{\cdot}0$
$a = 1''{\cdot}85$

Comparing observations made 1834·47 to 1883·62 with this orbit, Mr. Wilson finds that the position-angles are well represented, with the exception of those observed by Powell from 1859 to 1864, which seem to be affected by systematic error, and thinks we may conclude the period is not far from eighty years. It is to be hoped that numerous observations of this star will be obtained during the next ten years, while the distance is small and the angular motion rapid.

Oppolzer's Astronomical Refractions.—Herr Oppolzer has recently published, in the *Transactions* of the Mathematical and Natural Science Section of the Imperial Academy of Sciences of Vienna, vol. liii., a paper containing a theoretical discussion of the problem of astronomical refraction, followed by numerical tables intended to facilitate the practical application of the results at which he arrives. The relation between the temperature (t) and density (ρ) of the atmosphere which Herr Oppolzer adopts is

$$\frac{\delta t}{\delta \rho} = \epsilon + \Sigma k \rho^{\sigma - 1},$$

where k and σ are quantities depending on the state of the atmosphere and on the place of observation. Whatever may be thought of the legitimacy of a relation of this form from a theoretical point of view, it at all events has the advantage, in Herr Oppolzer's skilful hands, of leading to a comparatively simple expression for the amount of refraction, deduced from a modification of the ordinary differential equation. And that it is capable, when the approximations are carried far enough, of giving results of great accuracy for large zenith distances, is shown by a comparison made between the computed values of the refraction and the well-known observations of Argelander, which form the basis of Bessel's supplementary table given in the "Tabulæ Regiomontanæ," with the following results:—

Z.D.			Observed—Computed	Z.D.			Observed—Computed
°	′		″	°	′		″
85	0	...	− 1·1	88	0	...	− 2·5
86	0	...	+ 1·2	89	0	...	+ 2·3
87	0	...	− 1·3	89	30	...	+ 1·8

Comets Finlay and Barnard.—The following ephemerides for Berlin midnight are from the *Astronomische Nachrichten*, No. 2752:—

Comet Finlay (1886 *e*)

1886	R.A.			Decl.		Log *r*	Log Δ
	h.	m.	s.	°	′		
Nov. 8	19	25	22	24	56·8 S.	0·0751	0·0970
10		33	49	24	36·5		
12		42	24	24	14·1	0·0718	0·0932
14		51	5	23	49·5		
16	19	59	51	23	22·7 S.	0·0697	0·0899

Comet Barnard (1886 *f*)

1886	R.A.			Decl.		Log *r*	Log Δ
	h.	m.	s.	°	′		
Nov. 7	12	7	8	8	18·5 N.	0·0735	0·2031
9		15	5	9	0·3		
11		23	31	9	44·3	0·0551	0·1772
13		32	29	10	30·7		
15	12	42	1	11	19·2 N.	0·0366	0·1507